

SEQUENCE LISTING

(1) GENERAL INFORMATION:

- (i) APPLICANT: O'Donnell, Michael
- (ii) TITLE OF INVENTION: DNA POLYMERASE III HOLOENZYME
- (iii) NUMBER OF SEQUENCES: 60
- (iv) CORRESPONDENCE ADDRESS:
- (A) ADDRESSEE: Nixon, Hargrave, Devans & Doyle LLP
 - (B) STREET: Clinton Square, P.O. Box 1051
 - (C) CITY: Rochester
 - (D) STATE: New York
 - (E) COUNTRY: U.S.A.
 - (F) ZIP: 14603
- (v) COMPUTER READABLE FORM:
- (A) MEDIUM TYPE: Floppy disk
 - (B) COMPUTER: IBM PC compatible
 - (C) OPERATING SYSTEM: PC-DOS/MS-DOS
 - (D) SOFTWARE: Patent In Release #1.0, Version #1.30
- (vi) CURRENT APPLICATION DATA:
- (A) APPLICATION NUMBER: US 08/828,323
 - (B) FILING DATE: 28-MAR-1997
 - (C) CLASSIFICATION:
- (viii) ATTORNEY/AGENT INFORMATION:
- (A) NAME: Goldman, Michael L.
 - (B) REGISTRATION NUMBER: 30,727
 - (C) REFERENCE/DOCKET NUMBER: 19603/10213
- (ix) TELECOMMUNICATION INFORMATION:
- (A) TELEPHONE: (716) 263-1304
 - (B) TELEFAX: (716) 263-1600

(2) INFORMATION FOR SEQ ID NO:1:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 28 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:1:

Met Leu Arg Leu Tyr Pro Glu Gln Leu Arg Ala Gln Leu Asn Glu Gly
1 5 10 15

Leu Arg Ala Ala Tyr Leu Leu Leu Gly Asn Asp Pro
20 25

(2) INFORMATION FOR SEQ ID NO:2:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 21 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:2:

Ala Ala Tyr Leu Leu Leu Gly Asn Asp Pro Leu Leu Leu Gln Glu Ser
1 5 10 15

Gln Asp Ala Val Arg
20

(2) INFORMATION FOR SEQ ID NO:3:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 14 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:3:

Ala Gln Glu Asn Ala Ala Trp Phe Thr Ala Leu Ala Asn Arg
1 5 10

(2) INFORMATION FOR SEQ ID NO:4:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 24 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:4:

Val Glu Gln Ala Val Asn Asp Ala Ala His Phe Thr Pro Phe His Trp
1 5 10 15

Val Asp Ala Leu Leu Met Gly Lys
20

(2) INFORMATION FOR SEQ ID NO:5:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 33 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:5:

GTACAACCGA ATCATATGTT ACCCAGCGAG CTC

33

(2) INFORMATION FOR SEQ ID NO:6:

- (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 1032 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:6:

ATGATTCGGT TGTACCCGGA ACAACTCCGC GCGCAGCTCA ATGAAGGGCT GCGCGCGGCG	60
TATCTTTTAC TTGGTAACGA TCCTCTGTTA TTGCAGGAAA GCCAGGACGC TGTTTCGTCAG	120
GTAGCTGCGG CACAAGGATT CGAAGAACAC CACACTTTTT CCATTGATCC CAACACTGAC	180
TGGAATGCGA TCTTTTCGTT ATGCCAGGCT ATGAGTCTGT TTGCCAGTCG ACAAACGCTA	240
TTGCTGTTGT TACCAGAAAA CGGACCGAAT GCGGCGATCA ATGAGCAACT TCTCACACTC	300
ACCGGACTTC TGCATGACGA CCTGCTGTTG ATCGTCCGCG GTAATAAATT AAGCAAAGCG	360
CAAGAAAATG CCGCCTGGTT TACTGCGCTT GCGAATCGCA GCGTGCAGGT GACCTGTCAG	420
ACACCGGAGC AGGCTCAGCT TCCCCGCTGG GTTGCTGCGC GCGCAAAACA GCTCAACTTA	480
GAAGTGGATG ACGCGGCAAA TCAGGTGCTC TGCTACTGTT ATGAAGGTAA CCTGCTGGCG	540
CTGGCTCAGG CACTGGAGCG TTTATCGCTG CTCTGGCCAG ACGGCAAATT GACATTACCG	600
CGCGTTGAAC AGGCGGTGAA TGATGCCGCG CATTTACCC CTTTTATTG GGTGATGCT	660
TTGTTGATGG GAAAAAGTAA GCGCGCATTG CATATTCTTC AGCAACTGCG TCTGGAAGGC	720
AGCGAACCGG TTATTTTGTG GCGCACATTA CAACGTGAAC TGTTGTTACT GGTTAACCTG	780
AAACGCCAGT CTGCCCATAC GCCACTGCGT GCGTTGTTTG ATAAGCATCG GGTATGGCAG	840
AACCGCCGGG GCATGATGGG CGAGGCGTTA AATCGCTTAA GTCAGACGCA GTTACGTCAG	900
GCCGTGCAAC TCCTGACACG AACGGAAC TCACCTCAAAC AAGATTACGG TCAGTCAGTG	960
TGGGCAGAGC TGGAAGGGTT ATCTCTTCTG TTGTGCCATA AACCCCTGGC GGACGTATTT	1020
ATCGACGGTT GA	1032

(2) INFORMATION FOR SEQ ID NO:7:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 127 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:7:

```
CCGAACAGCT GATTCGTAAG CTGCCAAGCA TCCGTGCTGC GGATATTCGT TCCGACGAAG      60
AACAGACGTC GACCACAACG GATACTCCGG CAACGCCTGC ACGCGTCTCC ACCACGCTGG      120
GTAACGTG                                     127
```

(2) INFORMATION FOR SEQ ID NO:8:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 102 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:8:

```
TATGAAATCT TTACAGGCTC TGTTTGCGG CACCTTTGAT CCGGTGCACT ATGGTCATCT      60
AAAACCCGTT GGAAGCGTGG CCGAAGTTTT GATTGGTCTG AC                          102
```

(2) INFORMATION FOR SEQ ID NO:9:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 343 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:9:

```
Met Ile Arg Leu Tyr Pro Glu Gln Leu Arg Ala Gln Leu Asn Glu Gly
1           5           10           15
```

Leu Arg Ala Ala Tyr Leu Leu Leu Gly Asn Asp Pro Leu Leu Leu Gln
 20 25 30
 Glu Ser Gln Asp Ala Val Arg Gln Val Ala Ala Ala Gln Gly Phe Glu
 35 40 45
 Glu His His Thr Phe Ser Ile Asp Pro Asn Thr Asp Trp Asn Ala Ile
 50 55 60
 Phe Ser Leu Cys Gln Ala Met Ser Leu Phe Ala Ser Arg Gln Thr Leu
 65 70 75 80
 Leu Leu Leu Leu Pro Glu Asn Gly Pro Asn Ala Ala Ile Asn Glu Gln
 85 90 95
 Leu Leu Thr Leu Thr Gly Leu Leu His Asp Asp Leu Leu Leu Ile Val
 100 105 110
 Arg Gly Asn Lys Leu Ser Lys Ala Gln Glu Asn Ala Ala Trp Phe Thr
 115 120 125
 Ala Leu Ala Asn Arg Ser Val Gln Val Thr Cys Gln Thr Pro Glu Gln
 130 135 140
 Ala Gln Leu Pro Arg Trp Val Ala Ala Arg Ala Lys Gln Leu Asn Leu
 145 150 155 160
 Glu Leu Asp Asp Ala Ala Asn Gln Val Leu Cys Tyr Cys Tyr Glu Gly
 165 170 175
 Asn Leu Leu Asn Leu Ala Gln Ala Leu Glu Arg Leu Ser Leu Leu Trp
 180 185 190
 Pro Asp Gly Lys Leu Thr Leu Pro Arg Val Glu Gln Ala Val Asn Asp
 195 200 205
 Ala Ala His Phe Thr Pro Phe His Trp Val Asp Ala Leu Leu Met Gly
 210 215 220
 Lys Ser Lys Arg Ala Leu His Ile Leu Gln Gln Leu Arg Leu Gly Gly
 225 230 235 240
 Ser Glu Pro Val Ile Leu Leu Arg Thr Leu Gln Arg Glu Leu Leu Leu
 245 250 255
 Leu Val Asn Leu Lys Arg Gln Ser Ala His Thr Pro Leu Arg Ala Leu
 260 265 270

Phe Asp Lys His Arg Val Trp Gln Asn Arg Arg Gly Met Met Gly Glu
 275 280 285
 Ala Leu Asn Arg Leu Ser Gln Thr Gln Leu Arg Gln Ala Val Gln Leu
 290 295 300
 Leu Thr Arg Thr Glu Leu Thr Leu Lys Gln Asp Tyr Gly Gln Ser Val
 305 310 315 320
 Trp Ala Glu Leu Glu Gly Leu Ser Leu Leu Leu Cys His Lys Pro Leu
 325 330 335
 Ala Asp Val Phe Ile Asp Gly
 340

(2) INFORMATION FOR SEQ ID NO:10:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 334 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:10:

Met Arg Trp Tyr Pro Trp Leu Arg Pro Asp Phe Glu Lys Leu Val Ala
 1 5 10 15
 Ser Tyr Gln Ala Gly Arg Gly His His Ala Leu Leu Ile Gln Ala Leu
 20 25 30
 Pro Gly Met Gly Asp Asp Ala Leu Ile Tyr Ala Leu Ser Arg Tyr Leu
 35 40 45
 Leu Cys Gln Gln Pro Gln Gly His Lys Ser Cys Gly His Cys Arg Gly
 50 55 60
 Cys Gln Leu Met Gln Ala Gly Thr His Pro Asp Tyr Tyr Thr Leu Ala
 65 70 75 80
 Pro Glu Lys Gly Lys Asn Thr Leu Gly Val Asp Ala Val Arg Glu Val
 85 90 95

Thr Glu Lys Leu Asn Glu His Ala Arg Leu Gly Gly Ala Lys Val Val
 100 105 110
 Trp Val Thr Asp Ala Ala Leu Leu Thr Asp Ala Ala Ala Asn Ala Leu
 115 120 125
 Leu Lys Thr Leu Glu Glu Pro Pro Ala Glu Thr Trp Phe Phe Leu Ala
 130 135 140
 Thr Arg Glu Pro Glu Arg Leu Leu Ala Thr Leu Arg Ser Arg Cys Arg
 145 150 155 160
 Leu His Tyr Leu Ala Pro Pro Pro Glu Gln Tyr Ala Val Thr Trp Leu
 165 170 175
 Ser Arg Glu Val Thr Met Ser Gln Asp Ala Leu Leu Ala Ala Leu Arg
 180 185 190
 Leu Ser Ala Gly Ser Pro Gly Ala Ala Leu Ala Leu Phe Gln Gly Asp
 195 200 205
 Asn Trp Gln Ala Arg Glu Thr Leu Cys Gln Ala Leu Ala Tyr Ser Val
 210 215 220
 Pro Ser Gly Asp Trp Tyr Ser Leu Leu Ala Ala Leu Asn His Glu Gln
 225 230 235 240
 Ala Pro Ala Arg Leu His Trp Leu Ala Thr Leu Leu Met Asp Ala Leu
 245 250 255
 Lys Arg His His Gly Ala Ala Gln Val Thr Asn Val Asp Val Pro Gly
 260 265 270
 Leu Val Ala Glu Leu Ala Asn His Leu Ser Pro Ser Arg Leu Gln Ala
 275 280 285
 Ile Leu Gly Asp Val Cys His Ile Arg Glu Gln Leu Met Ser Val Thr
 290 295 300
 Gly Ile Asn Arg Glu Leu Leu Ile Thr Asp Leu Leu Leu Arg Ile Glu
 305 310 315 320
 His Tyr Leu Gln Pro Gly Val Val Leu Pro Val Pro His Leu
 325 330

(2) INFORMATION FOR SEQ ID NO:11:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 57 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:11:

ACTCTGGAAG AACCGCCGGC TGAAACTTGG TTTTCTCTGG CTACTCGTGA ACCGGAA

57

(2) INFORMATION FOR SEQ ID NO:12:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 54 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:12:

GCTGGTTCTC CGGGTGCTGC TCTGGCTCTG TTTCAGGGTG ATGACTGGCA GGCT

54

(2) INFORMATION FOR SEQ ID NO:13:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 1002 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:13:

ATGAGATGGT ATCCATGGTT ACGACCTGAT TTCGAAAAAC TGGTAGCCAG CTATCAGGCC

60

GGAAGAGGTC ACCATGCGCT ACTCATTAG GCGTTACCGG GCATGGGCGA TGATGCTTTA

120

ATCTACGCCC TGAGCCGTTA TTTACTCTGC CAACAACCGC AGGGCCACAA AAGTTGCGGT 180
 CACTGTCGTG GATGTCAGTT GATGCAGGCT GGCACGCATC CCGATTACTA CACCCTGGCT 240
 CCCGAAAAAG GAAAAAATAC GCTGGGCGTT GATGCGGTAC GTGAGGTCAC CGAAAAGCTG 300
 AATGAGCACG CACGCTTAGG TGGTGCGAAA GTCGTTTGGG TAACCGATGC TGCCTTACTA 360
 ACCGACGCCG CGGCTAACGC ATTGCTGAAA ACGCTTGAAG AGCCACCAGC AGAAACTTGG 420
 TTTTTCCTGG CTACCCGCGA GCCTGAACGT TTTACTGGCAA CATTACGTAG TCGTTGTCGG 480
 TTACATTACC TTGCGCCGCC GCCGGAACAG TACGCCGTGA CCTGGCTTTC ACGCGAAGTG 540
 ACAATGTCAC AGGATGCATT ACTTGCCGCA TTGCGCTTAA GCGCCGGTTC GCCTGGCGCG 600
 GCACTGGCGT TGTTTCAGGG AGATAACTGG CAGGCTCGTG AAACATTGTG TCAGGCGTTG 660
 GCATATAGCG TGCCATCGGG CGATTGGTAT TCGCTGCTAG CGGCCCTTAA TCATGAACAA 720
 GTCCCGGCGC GTTTTAACTG GCTGGCAACG TTGCTGATGG ATGCGCTAAA ACGCCATCAT 780
 GGTGCTGCGC AGGTGACCAA TGTGATGTG CCGGGCCTGG TCGCCGAACG GGCAAACCAT 840
 CTTTCTCCCT CGCGCCTGCA GGCTATACTG GGGGATGTTT GCCACATTCG TGAACAGTTA 900
 ATGTCTGTGA CAGGCATCAA CCGCGAGCTT CTCATCACCG ATCTTTTACT GCGTATTGAG 960
 CATTACCTGC AACCAGGCGT TGTGCTACCG GTTCCTCATC TT 1002

(2) INFORMATION FOR SEQ ID NO:14:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 157 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:14:

AAGAATCTTT CGATTTCTTT AATCGCACCC GCGCCCGCTA TCTGGAAGTG GCAGCACAAG 60
 ATAAAAGCAT TCATACCATT GATGCCACCC AGCCGCTGGA GGCCGTGATG GATGCAATCC 120
 GCACTACCGT GACCCACTGG GTGAAGGAGT TGGACGC 157

(2) INFORMATION FOR SEQ ID NO:15:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 143 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:15:

TTAGAGAGAC ATCATGTTTT TAGTGGACTC AACTGCCAT CTCGATGGTC TGGATTATGA 60
 ATCTTTGCAT AAGGACGTGG ATGACGTTCT GGCAGAAAGCC GCCGCACGCG ATGTGAAATT 120
 TTGTCTGGCA GTCGCCACAA CAT 143

(2) INFORMATION FOR SEQ ID NO:16:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 16 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:16:

Met Arg Trp Tyr Pro Pro Leu Arg Pro Asp Phe Glu Lys Leu Val Ala
 1 5 10 15

(2) INFORMATION FOR SEQ ID NO:17:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 11 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:17:

Glu Val Thr Glu Lys Leu Asn Glu His Ala Arg
1 5 10

(2) INFORMATION FOR SEQ ID NO:18:

(i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 20 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:18:

Val Val Trp Val Thr Asp Ala Ala Leu Leu Thr Asp Ala Ala Ala Asn
1 5 10 15

Ala Leu Leu Lys
20

(2) INFORMATION FOR SEQ ID NO:19:

(i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 25 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:19:

Thr Leu Glu Glu Pro Pro Ala Glu Thr Trp Phe Phe Leu Ala Thr Arg
1 5 10 15

Glu Pro Glu Arg Leu Leu Ala Thr Leu
20 25

(2) INFORMATION FOR SEQ ID NO:20:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 18 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:20:

Leu His Tyr Leu Ala Pro Pro Pro Glu Gln Tyr Ala Val Thr Trp Leu
 1 5 10 15

Ser Arg

(2) INFORMATION FOR SEQ ID NO:21:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 21 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:21:

Leu Ser Ala Gly Ser Pro Gly Ala Ala Leu Ala Leu Phe Gln Gly Asp
 1 5 10 15

Asn Trp Gln Ala Arg
 20

(2) INFORMATION FOR SEQ ID NO:22:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 5 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:22:

Leu Gly Gly Ala Lys
1 5

(2) INFORMATION FOR SEQ ID NO:23:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 58 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:23:

Ala Cys Thr Cys Thr Gly Gly Ala Ala Gly Ala Ala Cys Cys Gly Cys
1 5 10 15
Cys Gly Gly Cys Thr Thr Gly Ala Ala Ala Cys Thr Thr Gly Gly Thr
20 25 30
Thr Thr Thr Thr Thr Cys Thr Gly Gly Cys Thr Ala Cys Thr Cys Gly
35 40 45
Thr Gly Ala Ala Cys Cys Gly Gly Ala Ala
50 55

(2) INFORMATION FOR SEQ ID NO:24:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 54 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:24:

Gly Cys Thr Gly Gly Thr Thr Cys Thr Cys Cys Gly Gly Gly Thr Gly
 1 5 10 15
 Cys Thr Gly Cys Thr Cys Thr Gly Gly Cys Thr Cys Thr Gly Thr Thr
 20 25 30
 Thr Cys Ala Gly Gly Gly Thr Gly Ala Thr Ala Ala Cys Thr Gly Gly
 35 40 45
 Cys Ala Gly Gly Cys Thr
 50

(2) INFORMATION FOR SEQ ID NO:25:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 33 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:25:

Gly Gly Thr Gly Ala Ala Gly Gly Ala Gly Thr Thr Gly Gly Ala Cys
 1 5 10 15
 Ala Thr Ala Thr Gly Ala Gly Ala Thr Gly Gly Thr Ala Thr Cys Cys
 20 25 30
 Ala

(2) INFORMATION FOR SEQ ID NO:26:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 40 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:26:

Met Leu Lys Asn Leu Ala Lys Leu Asp Gln Thr Glu Met Asp Lys Val
 1 5 10 15
 Asn Val Asp Leu Ala Ala Ala Gly Val Ala Phe Lys Glu Arg Tyr Asn
 20 25 30
 Met Pro Val Ile Ala Glu Ala Val
 35 40

(2) INFORMATION FOR SEQ ID NO:27:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 57 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:27:

ATGCTGAAAA ACCTGGCTAA ACTGGATCAG ACTGAAATGG ATAAAGTTAA CGTTGAT 57

(2) INFORMATION FOR SEQ ID NO:28:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 57 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:28:

CTGGCTGCTG CTGGTGTTC TTTTAAGGAA CGTTATAACA TGCCGGTTAT TGCTGAA 57

(2) INFORMATION FOR SEQ ID NO:29:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 228 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:29:

ATGCTGAAGA ATCTGGCTAA ACTGGATCAA ACAGAAATGG ATAAAGTGAA TGTCGATTTG 60
 GCGGCGGCCG GGGTGGCATT TAAAGAACGC TACAATATGC CGGTGATCGC TGAAGCGGTT 120
 GAACGTGAAC AGCCTGAACA TTTGCGCAGC TGGTTTCGCG AGCGGCTTAT TGCCCACCGT 180
 TTGGCTTCGG TCAATCTGTC ACGTTTACCT TACGAGCCCA AACTTAAA 228

(2) INFORMATION FOR SEQ ID NO:30:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 172 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:30:

AGGCGTAGCG AAGGGAGCGT GCAGTTGAAG CCATATTATC TATTCCTTTT TGTAATAACT 60
 TTTTACAGA CGATAACCTT GTCTAATGTC TGAGTCGAGG ATCATCAATT CCGGCTTGCC 120
 ATCCTGGCTC ACTCTTAGTA ACTTTTGCCC GCGAATGATG AGGAGATTAA GA 172

(2) INFORMATION FOR SEQ ID NO:31:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 107 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: single

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:31:

TAAAACTTAT ACAGAGTTAC ACTTTCTTAC ATAACGCCTG CTAAATTATG AGTATTTTCT 60
AAACCGCACT CATAATTGTC AGTCATTTTG AAAAGGAAGT CATTATG 107

(2) INFORMATION FOR SEQ ID NO:32:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 76 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:32:

Met	Leu	Lys	Asn	Leu	Ala	Lys	Leu	Asp	Gln	Thr	Glu	Met	Asp	Lys	Val
1				5					10					15	
Asn	Val	Asp	Leu	Ala	Ala	Ala	Gly	Val	Ala	Phe	Lys	Glu	Arg	Tyr	Asn
			20					25						30	
Met	Pro	Val	Ile	Ala	Glu	Ala	Val	Glu	Arg	Glu	Gln	Pro	Glu	His	Leu
			35				40					45			
Arg	Ser	Trp	Phe	Arg	Glu	Arg	Leu	Ile	Ala	His	Arg	Leu	Ala	Ser	Val
	50					55					60				
Asn	Leu	Ser	Arg	Leu	Pro	Tyr	Glu	Pro	Lys	Leu	Lys				
65					70					75					

(2) INFORMATION FOR SEQ ID NO:33:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 40 amino acids
- (B) TYPE: amino acid

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:33:

```
Met  Leu  Lys  Asn  Leu  Ala  Lys  Leu  Asp  Gln  Thr  Glu  Met  Asp  Lys  Val
1      5      10      15

Asn  Val  Asp  Leu  Ala  Ala  Ala  Gly  Val  Ala  Phe  Lys  Glu  Ala  Tyr  Asn
      20      25      30

Met  Pro  Val  Ile  Ala  Glu  Ala  Val
      35      40
```

(2) INFORMATION FOR SEQ ID NO:34:

(i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 57 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:34:

ATGCTGAAAA ACCTGGCTAA ACTGGATCAG ACTGAAATGG ATAAAGTTAA CGTTGAT

57

(2) INFORMATION FOR SEQ ID NO:35:

(i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 57 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:35:

CTGGCTGCTG CTGGTGTTGC TTTTAAAGAA CGTTATAACA TGCCGGTTAT TGCTGAA

57

(2) INFORMATION FOR SEQ ID NO:36:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 33 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:36:

ATGATGAGGA GATTACATAT GCTGAAGAAT CTG

33

(2) INFORMATION FOR SEQ ID NO:37:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 51 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:37:

GAGGAATTCG GCTTTTTTGC CGAATTCCTC GGCCCCTAGG AGATCTCAGC T

51


(2) INFORMATION FOR SEQ ID NO:38:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 137 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:38:



Met	Thr	Ser	Arg	Arg	Asp	Trp	Gln	Leu	Gln	Gln	Leu	Gly	Ile	Thr	Gln	1	5	10	15
Trp	Ser	Leu	Arg	Arg	Pro	Gly	Ala	Leu	Gln	Gly	Glu	Ile	Ala	Ile	Ala	20	25	30	
Ile	Pro	Ala	His	Val	Arg	Leu	Val	Met	Val	Ala	Asn	Asp	Leu	Pro	Ala	35	40	45	
Leu	Thr	Asp	Pro	Leu	Val	Ser	Asp	Val	Leu	Arg	Ala	Leu	Thr	Val	Ser	50	55	60	
Pro	Asp	Gln	Val	Leu	Gln	Leu	Thr	Pro	Glu	Lys	Ile	Ala	Met	Leu	Pro	65	70	75	80
Gln	Gly	Ser	His	Cys	Asn	Ser	Trp	Arg	Leu	Gly	Thr	Asp	Glu	Pro	Leu	85	90	95	
Ser	Leu	Glu	Gly	Ala	Gln	Val	Ala	Ser	Pro	Ala	Leu	Thr	Asp	Leu	Arg	100	105	110	
Ala	Asn	Pro	Thr	Ala	Arg	Ala	Ala	Leu	Trp	Gln	Gln	Ile	Cys	Thr	Tyr	115	120	125	
Glu	His	Asp	Phe	Phe	Pro	Gly	Asn	Asp	130	135									

(2) INFORMATION FOR SEQ ID NO:39:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 411 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:39:

ATGACATCCC GACGAGACTG GCAGTTACAG CAACTGGGCA TTACCCAGTG GTCGCTGCGT 60
 CGCCCTGGCG CGTTGCAGGG CGAGATTGCC ATTGCGATCC CGGCACACGT CCGTCTGGTG 120
 ATGGTGGCAA ACGATCTTCC CGCCCTGACT GATCCTTTAG TGAGCGATGT TCTGCGCGCA 180
 TTAACCGTCA GCCCCGACCA GGTGCTGCAA CTGACGCCAG AAAAAATCGC GATGCTGCCG 240
 CAAGGCAGTC ACTGCAACAG TTGGCGGTTG GGTACTGACG AACCGCTATC ACTGGAAGGC 300
 GCTCAGGTGG CATCACCGGC GCTCACCGAT TTACGGGCAA ACCCAACGGC ACGCGCCGCG 360
 TTATGGCAAC AAATTTGCAC ATATGAACAC GATTTCTTCC CTGGAAACGA C 411

(2) INFORMATION FOR SEQ ID NO:40:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 77 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:40:

GGCGATTATA GCCATATGTT GGCGCGGTAT CGACGAATTT GCTATATTTG CGCCCTGAC 60
 AACAGGAGCG ATTCGCT 77

(2) INFORMATION FOR SEQ ID NO:41:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 103 base pairs
 - (B) TYPE: nucleic acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:41:

TGATTTACCG GCAGCTTACC ACATTGAACA ACGCGCCAC GCCTTTCCGT GGAGTGAAAA 60
AACGTTTGCC AGCAACCAGG GCGAGCGTTA TCTCAACTTT CAG 103

(2) INFORMATION FOR SEQ ID NO:42:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 27 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:42:

GATTCCATAT GACATCCCGA CGAGACT 27

(2) INFORMATION FOR SEQ ID NO:43:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 30 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:43:

GACTGGATCC CTGCAGGCCG GTGAATGAGT 30

(2) INFORMATION FOR SEQ ID NO:44:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 17 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:44:

Leu Gly Thr Asp Glu Pro Leu Ser Leu Glu Glu Ala Gln Val Ala Ser
1 5 10 15

Pro

(2) INFORMATION FOR SEQ ID NO:45:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 17 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:45:

Ala Ala Leu Trp Gln Gln Ile Cys Thr Tyr Glu His Asp Phe Phe Pro
1 5 10 15

Ala

(2) INFORMATION FOR SEQ ID NO:46:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 32 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:46:

CAACAGGAGC GATTCCATAT GACATCCCGA CG

(2) INFORMATION FOR SEQ ID NO:47:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 31 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:47:

GATTCGGATC CCTGCAGGCC GGTGAATGAG T

31

(2) INFORMATION FOR SEQ ID NO:48:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 30 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:48:

CCCCACATAT GAAAAACGCG ACGTTCTACC

30

(2) INFORMATION FOR SEQ ID NO:49:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 28 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:49:

ACCCGGATCC AACTGCCGG TGACATTC

28

(2) INFORMATION FOR SEQ ID NO:50:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 441 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:50:

ATGAAAAACG CGACGTTCTA CCTTCTGGAC AATGACACCA CCGTCGATGG CTTAAGCGCC	60
GTTGAGCACC TGGTGTGTGA AATTGCCGCA GAACGTTGGC GCAGCGGTAA GCGCGTGCTC	120
ATCGCCTGTG AAGATGAAAA GCAGGCTTAC GCCCTGGATG AAGCCCTGTG GGCGCGTCCG	180
GCAGAAAGCT TTGTTCCGCA TAATTTAGCG GGAGAAGGAC CGCGCGGCGG TGTACCGGTG	240
GAGATCGCCT GGCCGCAAAA GCGTAGCAGC AGCCGGCGCG ATATATTGAT TAGTCTGCGA	300
ACAAGCTTTG CAGATTTTGC CACCGCTTTT ACAGAAGTGG TAGACTTCGT TCCTCATGAA	360
GATTCTCTGA AACAACTGGC GCGCGAACGC TATAAAGCCT ACCGCGTGGC TGGTTTCAAC	420
CTGAATACGG CAACTTGGA A	441

(2) INFORMATION FOR SEQ ID NO:51:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 175 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:51:

TAACGGCGAA GAGTAATTGC GTCAGGCAAG GCTGTTATTG CCGGATGCGG CGTGAACGCC 60
 TTATCCGACC TACACAGCAC TGAACTCGTA GGCCTGATAA GACACAACAG CGTCGCATCA 120
 GGCGCTGCGG TGTATACCTG ATGCGTATTT AAATCCACCA CAAGAAGCCC CATT 175

(2) INFORMATION FOR SEQ ID NO:52:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 100 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:52:

TAATGGAAAA GACATATAAC CCACAAGATA TCGAACAGCC GCTTTACGAG CACTGGGAAA 60
 AAAGCCAGGA AAGTTTCTGC ATCATGATCC CGCCGCCGAA 100

(2) INFORMATION FOR SEQ ID NO:53:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 147 amino acids
- (B) TYPE: amino acid
- (C) STRANDEDNESS: single
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:53:

Met Lys Asp Ala Thr Phe Tyr Leu Leu Asp Asn Asp Thr Thr Val Asp
 1 5 10 15
 Gly Leu Ser Ala Val Glu Gln Leu Val Cys Glu Ile Ala Ala Glu Arg
 20 25 30

Trp Arg Ser Gly Lys Arg Val Leu Ile Ala Cys Glu Asp Glu Lys Gln
 35 40 45
 Ala Tyr Arg Leu Asp Glu Ala Leu Trp Ala Arg Pro Ala Glu Ser Phe
 50 55 60
 Val Pro His Asn Leu Ala Gly Glu Gly Pro Arg Gly Gly Ala Pro Val
 65 70 75 80
 Glu Ile Ala Trp Pro Gln Lys Arg Ser Ser Ser Arg Arg Asp Ile Leu
 85 90 95
 Ile Ser Leu Arg Thr Ser Phe Ala Asp Phe Ala Thr Ala Phe Thr Glu
 100 105 110
 Val Val Asp Phe Val Pro Tyr Glu Asp Ser Leu Lys Gln Leu Ala Arg
 115 120 125
 Glu Arg Tyr Lys Ala Tyr Arg Val Ala Gly Phe Asn Leu Asn Thr Ala
 130 135 140
 Thr Trp Lys
 145

(2) INFORMATION FOR SEQ ID NO:54:

- (i) SEQUENCE CHARACTERISTICS:
- (A) LENGTH: 29 amino acids
 - (B) TYPE: amino acid
 - (C) STRANDEDNESS: single
 - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:54:

Met Lys Asn Ala Thr Phe Tyr Leu Leu Asp Asn Asp Thr Thr Val Asp
 1 5 10 15
 Gly Leu Ser Ala Val Glu Gln Leu Val Xaa Glu Ile Ala
 20 25

(2) INFORMATION FOR SEQ ID NO:55:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 9 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:55:

Val Leu Ile Ala Xaa Glu Asp Glu Lys
1 5

(2) INFORMATION FOR SEQ ID NO:56:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 21 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:56:

Leu Asp Glu Ala Leu Trp Ala Ala Pro Ala Glu Ser Phe Val Pro His
1 5 10 15

Asn Leu Ala Gly Glu
20

(2) INFORMATION FOR SEQ ID NO:57:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 10 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:57:

Gly Gly Ala Pro Val Glu Ile Ala Trp Pro
1 5 10

(2) INFORMATION FOR SEQ ID NO:58:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 8 amino acids
 (B) TYPE: amino acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:58:

Gly Phe Asn Leu Asn Thr Ala Thr
1 5

(2) INFORMATION FOR SEQ ID NO:59:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 30 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: single
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:59:

CCCCACATAT GAAAAACGCG ACGTTCTACC

30

(2) INFORMATION FOR SEQ ID NO:60:

- (i) SEQUENCE CHARACTERISTICS:
 (A) LENGTH: 28 base pairs
 (B) TYPE: nucleic acid
 (C) STRANDEDNESS: single

104-31

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:60:

ACCCGGATCC AAAGTGCCGG TGACGTTC

28